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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/30/2004

McGuireWoods LLP
Suite 1800
1750 Tysons Boulevard
McLean, VA 22102

EXAMINER

BARRECA, NICOLE M

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/627,752

Applicant(s)

PARK ET AL.

Examiner

Nicole M Barreca

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 11/24/03
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/417,045.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/25/2002
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 22-24 are pending in this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakao (US 5,882,827).
4. Photomask 10 comprising light transmitting region Tn1 (first part) formed of a region having a trench, light transmitting region Ta1 (second part) formed of a region without a trench, semi-shading regions Ta2 (third part) and shading regions S1 and S0 (fourth part). Semi-shading shifter film 3 has a transmittance between 3% and 30%. Shading film 5 has a transmittance of 0.1%. A positive photoresist may be exposed and developed, followed by etching of an underlying film. See Fig.1A and col.8, 46-col.10, 32.
5. Please note that as written any photoresist pattern meets the limitations of the applicant's claim of "a photoresist pattern having a varying thickness according to

locations", as there can be no pattern unless there is a difference or variation in thickness.

6. Claims 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakae (JP 62-281428, English abstract from JPO).

7. Positive photoresist 3 is formed on layer 2 and exposed through mask 4. Mask 4 includes opaque portion 4a (first part), transparent portion 4b (second part) and semi-transmitting portions 4d (third part) and 4e (fourth part). Exposure through transparent portion 4b results in the photoresist being fully removed in 6a, while exposure through the semi-transmitting portions 4d and 4e result in the photoresist being partially removed in 6c and 6b. This results in photoresist pattern 3a having different shaped grooves. The photoresist pattern transferred into layer 2 using a dry etching process. See Fig. 1-3.

8. Claims 22-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Hong (US, 6,255,130)

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

9. A photoresist layer is coated on the data conductor layer and patterned to be a pattern of varying thickness depending on location by exposure and development, followed by etching using the photoresist pattern. The exposure of the photomask is performed using a photomask having at least three parts of which transmittance are different from each other (col.3, 29-53. A positive photoresist (col.18, 31-35) and dry etch are preferred (col.19, 48-50).

10. Claims 22-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim (US 6,255,130).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

11. A photoresist layer is formed over a conductive layer in order to form a data wire. The photoresist pattern has three portions each having a different thickness. The photomask used to form this pattern has four regions having different levels of transmittance (col. 2, 3-38, col. 20, 62-col.21, 6 and cl.1-7). The photoresist may be positive (col.21, 7) and dry etching may be used (col.3, 14-17) to transfer the photoresist pattern.

Claim Rejections - 35 USC § 103

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12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao as applied to claim 22 above, and further in view of Noguchi (US 4,865,945).

14. The reference is silent on the type of etching used and does not disclose dry etching. Noguchi teaches that dry etching accurately transfers a photoresist pattern to a substrate (col.1, 26-31). It would have been obvious to one of ordinary skill in the art to dry etch in the method of Nakao because Noguchi teach that dry etching accurately transfers a photoresist pattern to a substrate.

Double Patenting

15. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

16. Claim 22 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 18 of U.S. Patent No. 6,642,074,

claim 7 of U.S. Patent No. 6,255,130 and claim 13 of U.S. Patent No. 6,531,392.

Although the conflicting claims are not identical (because the scope of the claims of the instant applicant and of the patents is not the same) they are not patentably distinct from each other because both the claims of the instant application and the claims of the patents recite a photolithography method wherein a photoresist is exposed using a photomask having more than three parts (at least three parts) having different transmittance, developing the photoresist to form a pattern having varying thickness and using the photoresist pattern to etch an underlying layer. Since the application claim is broader than the patent claims the application is anticipated by the patent claims, as taught by *In re Goodman*.

17. Claim 22 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 5 of U.S. Patent No. 6,678,018 and claim 4 of U.S. Patent 6,524,876. Although the conflicting claims are not identical, they are not patentably distinct from each other because both the claims of the instant application and the claims of the patents recite a photolithography method wherein a photoresist is exposed using a photomask having parts having different transmittance, developing the photoresist to form a pattern having varying thickness and using the photoresist pattern to etch an underlying layer. While the claims of the patents recite two or three portions having different transmissions and not more than three parts, it would have been obvious to one of ordinary skill in the art that any number of different mask portions may be used in order to produce to the desired thickness variations in the resulting photoresist pattern.


Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M Barreca whose telephone number is 571-272-1379. The examiner can normally be reached on Monday-Thursday (9AM-7PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nicole M Barreca
Examiner
Art Unit 1756



11/26/04